

1 **CLAIMS**

2       1.     A method of encoding a source image, the method comprising:  
3       generating a base layer representing a low-resolution portion of the source  
4     image, wherein the base layer has an associated aspect ratio; and  
5       generating an enhancement layer representing a high-resolution portion of  
6     the source image, wherein the enhancement layer has an associated aspect ratio,  
7     and wherein the aspect ratio associated with the enhancement layer differs from  
8     the aspect ratio associated with the base layer.

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10       2.     A method as recited in claim 1 wherein the aspect ratio associated  
11     with the base layer corresponds to an aspect ratio associated with low-resolution  
12     televisions.

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14       3.     A method as recited in claim 1 wherein the aspect ratio associated  
15     with the enhancement layer corresponds to an aspect ratio associated with high-  
16     resolution televisions.

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18       4.     A method as recited in claim 1 wherein the aspect ratio associated  
19     with the base layer is 4:3.

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21       5.     A method as recited in claim 1 wherein the aspect ratio associated  
22     with the enhancement layer is 16:9.  
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1           6.    A method as recited in claim 1 wherein the step of generating a base  
2 layer includes low-pass filtering the source image.

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4           7.    A method as recited in claim 1 wherein the step of generating an  
5 enhancement layer includes subtracting a portion of the base layer from a  
6 corresponding portion of the source image.

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8           8.    A method as recited in claim 1 wherein the step of generating an  
9 enhancement layer includes:

10           extracting a first image from the base layer, wherein the aspect ratio of the  
11 first image differs from the aspect ratio of the base layer;

12           extracting a second image from the source image, wherein the aspect ratio  
13 of the second image matches the aspect ratio of the first image; and

14           subtracting the first image from the second image.

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16           9.    A method as recited in claim 8 wherein the aspect ratio of the first  
17 image matches an aspect ratio associated with high-resolution televisions.

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19           10.   A method as recited in claim 8 further including determining a  
20 vertical offset value, wherein the vertical offset value indicates the location from  
21 which the first image is extracted from the base layer.

1           **11.**    A method as recited in claim 8 further including determining a  
2 horizontal offset value, wherein the horizontal offset value indicates the location  
3 from which the first image is extracted from the base layer.

4  
5           **12.**    A method as recited in claim 1 wherein the step of generating an  
6 enhancement layer includes high-pass filtering the source image.

7  
8           **13.**    A method as recited in claim 1 further including combining the base  
9 layer and the enhancement layer into a single transport stream.

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11           **14.**   A method as recited in claim 1 further including transmitting the  
12 base layer and the enhancement layer to an image decoding system.

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14           **15.**   A method as recited in claim 1 further including transmitting only  
15 the base layer to an image decoding system.

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17           **16.**   A method as recited in claim 1 further including transmitting the  
18 base layer to an image decoding system using a first transmission medium and  
19 transmitting the enhancement layer to the image decoding system using a second  
20 transmission medium.

1           **17.**    A method as recited in claim 1 further including transmitting the  
2 base layer to an image decoding system using a first transmission format and  
3 transmitting the enhancement layer to the image decoding system using a second  
4 transmission format.

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6           **18.**    A method as recited in claim 1 further including storing the base  
7 layer and the enhancement layer on a storage medium.

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9           **19.**    A method as recited in claim 1 further including storing the base  
10 layer on a first storage medium and storing the enhancement layer on a second  
11 storage medium.

12  
13           **20.**    One or more computer-readable memories containing a computer  
14 program that is executable by a processor to perform the method recited in claim  
15 1.

16  
17           **21.**    A method comprising:  
18           decoding a first layer representing a low-resolution portion of an encoded  
19 image, wherein the first layer has an associated aspect ratio; and  
20           decoding a second layer representing a high-resolution portion of the  
21 encoded image, wherein the second layer has an associated aspect ratio, and  
22 wherein the aspect ratio associated with the second layer differs from the aspect  
23 ratio associated with the first layer.  
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1           **22.**    A method as recited in claim 21 wherein the aspect ratio associated  
2 with the first layer corresponds to an aspect ratio associated with low-resolution  
3 televisions.

4  
5           **23.**    A method as recited in claim 21 wherein the aspect ratio associated  
6 with the second layer corresponds to an aspect ratio associated with high-  
7 resolution televisions.

8  
9           **24.**    A method as recited in claim 21 wherein the aspect ratio associated  
10 with the first layer is 4:3.

11  
12           **25.**    A method as recited in claim 21 wherein the aspect ratio associated  
13 with the second layer is 16:9.

14  
15           **26.**    A method as recited in claim 21 wherein the first layer is a base  
16 layer.

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18           **27.**    A method as recited in claim 21 wherein the second layer is an  
19 enhancement layer.

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21           **28.**    A method as recited in claim 21 further including communicating  
22 the first layer to a low-resolution television.

1           **29.**    A method as recited in claim 21 further including combining the  
2 second layer and a portion of the first layer to generate high-resolution image data.

3  
4           **30.**    A method as recited in claim 21 wherein the method is executed by  
5 a television.

6  
7           **31.**    A method as recited in claim 21 wherein the first layer is decoded  
8 from a physical medium and the second layer is decoded from a received data  
9 stream.

10  
11          **32.**    A method as recited in claim 21 further including correcting an  
12 anamorphic squeeze in the first layer.

13  
14          **33.**    A method as recited in claim 21 wherein the first layer is received at  
15 a first time and the second layer is received at a second time.

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17          **34.**    A method as recited in claim 21 wherein the first layer is received  
18 from a first media and the second layer is received from a second media.

19  
20          **35.**    One or more computer-readable memories containing a computer  
21 program that is executable by a processor to perform the method recited in claim  
22 21.

1           **36.**    A method comprising:  
2           transmitting a base layer representing a low-resolution portion of an image,  
3           wherein the base layer has an associated aspect ratio; and  
4           transmitting an enhancement layer representing a high-resolution portion of  
5           the image, wherein the enhancement layer has an associated aspect ratio, and  
6           wherein the aspect ratio associated with the enhancement layer differs from the  
7           aspect ratio associated with the base layer.

8  
9           **37.**    A method as recited in claim 36 wherein the aspect ratio associated  
10          with the base layer corresponds to an aspect ratio associated with low-resolution  
11          televisions.

12  
13          **38.**    A method as recited in claim 36 wherein the aspect ratio associated  
14          with the enhancement layer corresponds to an aspect ratio associated with high-  
15          resolution televisions.

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17          **39.**    A method as recited in claim 36 wherein the base layer is  
18          transmitted using a first transmission medium and the enhancement layer is  
19          transmitted using a second transmission medium.

20  
21          **40.**    A method as recited in claim 36 wherein the base layer is  
22          transmitted using a first transmission format and the enhancement layer is  
23          transmitted using a second transmission format.

1           **41.**    One or more computer-readable memories containing a computer  
2 program that is executable by a processor to perform the method recited in claim  
3 36.

4  
5           **42.**    An apparatus comprising:  
6           a base layer generator to generate a base layer having a first aspect ratio,  
7 wherein the base layer represents a low-resolution portion of an image; and  
8           an enhancement layer generator coupled to the base layer generator to  
9 generate an enhancement layer having a second aspect ratio, wherein the  
10 enhancement layer represents a high-resolution portion of the image, and wherein  
11 the first aspect ratio differs from the second aspect ratio.

12  
13           **43.**    An apparatus as recited in claim 42 wherein the base layer generator  
14 is a low-pass filter.

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16           **44.**    An apparatus as recited in claim 42 wherein the enhancement layer  
17 generator is a high-pass filter.

18  
19           **45.**    An apparatus as recited in claim 42 wherein the enhancement layer  
20 generator includes an image extractor to extract a portion of the base layer and a  
21 differencing module to subtract the extracted portion of the base layer from a  
22 corresponding portion of the image.



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2       **46.**     An apparatus as recited in claim 42 further including a transmitter  
3 coupled to the base layer generator and the enhancement layer generator, wherein  
4 the transmitter combines the base layer and the enhancement layer into a single  
5 transport stream.

6  
7       **47.**     An apparatus as recited in claim 42 further including a transmitter  
8 coupled to the base layer generator and the enhancement layer generator, wherein  
9 the transmitter transmits the base layer and the enhancement layer to an image  
10 decoding system.

11  
12       **48.**     An apparatus as recited in claim 42 further including a transmitter  
13 coupled to the base layer generator, wherein the transmitter that transmits only the  
14 base layer to an image decoding system.

15  
16       **49.**     An apparatus as recited in claim 42 further including a storage  
17 medium coupled to the base layer generator and the enhancement layer generator,  
18 wherein the storage medium stores the base layer and the enhancement layer.

19  
20       **50.**     An apparatus comprising:  
21       a base layer decoder to decode a base layer representing a low-resolution  
22 portion of an image, wherein the base layer has an associated aspect ratio; and  
23       an enhancement layer decoder coupled to the base layer decoder to decode  
24 an enhancement layer representing a high-resolution portion of an image, wherein  
25

1 the enhancement layer has an associated aspect ratio that differs from the aspect  
2 ratio associated with the base layer.

3  
4 **51.** An apparatus as recited in claim 50 wherein the aspect ratio  
5 associated with the base layer corresponds to an aspect ratio associated with low-  
6 resolution televisions.

7  
8 **52.** An apparatus as recited in claim 50 wherein the aspect ratio  
9 associated with the enhancement layer corresponds to an aspect ratio associated  
10 with high-resolution televisions.

11  
12 **53.** An apparatus as recited in claim 50 wherein the apparatus is a  
13 television.

14  
15 **54.** An apparatus as recited in claim 50 further including a receiver  
16 coupled to the base layer decoder and the enhancement layer decoder, wherein the  
17 receiver is to receive a transport stream containing a base layer and an  
18 enhancement layer.

19  
20 **55.** One or more computer-readable media having stored thereon a  
21 computer program comprising the following steps:

22 generating a first layer representing a low-resolution portion of a source  
23 image, wherein the first layer has an associated aspect ratio; and

24 generating a second layer representing a high-resolution portion of the  
25 source image, wherein the second layer has an associated aspect ratio, and wherein

1 the aspect ratio associated with the second layer is different from the aspect ratio  
2 associated with the first layer.

3  
4 **56.** One or more computer-readable media as recited in claim 55  
5 wherein the aspect ratio associated with the first layer is 4:3.

6  
7 **57.** One or more computer-readable media as recited in claim 55  
8 wherein the aspect ratio associated with the second layer is 16:9.

9  
10 **58.** One or more computer-readable media as recited in claim 55  
11 wherein the first layer is a base layer.

12  
13 **59.** One or more computer-readable media as recited in claim 55  
14 wherein the second layer is an enhancement layer.

15  
16 **60.** One or more computer-readable media as recited in claim 55  
17 wherein the step of generating a second layer includes comparing a portion of the  
18 first layer with a corresponding portion of the source image.

19  
20 **61.** One or more computer-readable media as recited in claim 55 further  
21 including transmitting the first layer and the second layer to an image decoding  
22 system.

1           **62.**    One or more computer-readable media as recited in claim 55 further  
2 including transmitting only the first layer to an image decoding system.

3  
4           **63.**    One or more computer-readable media as recited in claim 55 further  
5 including storing the first layer on a storage medium.

6  
7           **64.**    One or more computer-readable media as recited in claim 55 further  
8 including storing the second layer on a storage medium.

9  
10          **65.**    One or more computer-readable media having stored thereon a  
11 computer program comprising the following steps:

12           decoding a base layer representing a low-resolution portion of an encoded  
13 image, wherein the base layer has a first aspect ratio; and

14           decoding an enhancement layer representing a high-resolution portion of  
15 the encoded image, wherein the enhancement layer has a second aspect ratio, and  
16 wherein the first aspect ratio is different from the second aspect ratio.

17  
18          **66.**    One or more computer-readable media as recited in claim 65  
19 wherein the first aspect ratio is 4:3.

20  
21          **67.**    One or more computer-readable media as recited in claim 65  
22 wherein the second aspect ratio is 16:9.

1           **68.**    One or more computer-readable media as recited in claim 65 further  
2 including communicating the base layer to a low-resolution television.

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4           **69.**    One or more computer-readable media as recited in claim 65 further  
5 including communicating the base layer and the enhancement layer to a high-  
6 resolution television.

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